

## TECHNICAL BASIS FOR TIER I OPERATING PERMIT

**DATE:** December 11, 2002

**PERMIT WRITER:** Kent Berry

**PERMIT COORDINATOR:** Bill Rogers

**SUBJECT:** AIRS Facility No. 069-00001, Potlatch Corp., Lewiston  
Final Tier I Operating Permit  
Project No. T1-9505-064-1ipdd

<b>Permittee:</b>	Potlatch Corp., Idaho Pulp and Paperboard Division
<b>Permit No.:</b>	069-00001
<b>Standard Industrial Classification:</b>	2611
<b>Description:</b>	Pulp and Paperboard Manufacturing
<b>Kind of Products:</b>	Bleached kraft pulp, uncoated and coated paperboard
<b>Responsible Official:</b>	Frank Radle, Plant Manager
<b>Person to Contact:</b>	Susan Somers
<b>Telephone No.:</b>	(208) 799-4104
<b>No. of Full-time Employees</b>	834
<b>Area of Operation:</b>	787 acres
<b>Facility Classification:</b>	A
<b>County:</b>	Nez Perce
<b>Air Quality Control Region:</b>	62
<b>UTM Coordinates:</b>	501.9, 5141.3
<b>Exact Plant Location:</b>	805 Mill Road, Lewiston, Idaho

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## LIST OF ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
ADP	Air-Dried Pulp
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
Btu	British thermal units
CFR	Code of Federal Regulations
CO	carbon monoxide
CAA	Clean Air Act
CaO	lime
COMS	continuous opacity monitoring system
CEMS	continuous emission monitoring system
CERMS	continuous emission rate
Cl <sub>2</sub>	chlorine
ClO <sub>2</sub>	chlorine dioxide
CPD	Consumer Products Division
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
EQ	Environmental Quality Management Inc.
ESP	electrostatic precipitator
ft	feet
gal/mo	gallons per month
gpm	gallons per minute
gr	grain (1 lb = 7,000 grains)
H <sub>2</sub> S	hydrogen sulfide
HAPs	hazardous air pollutants
HCl	hydrochloric acid
HVLC	high volume low-concentration
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
IPPD	Idaho Pulp and Paperboard Division
km	kilometer
lb	pounds
lb/day	pounds per day
lb/hr	pounds per hour
lb/12 hr	pounds per 12 hours
lb/PM/tADP	pounds of PM per ton of air-dried pulp
lb/T	pounds per ton
MACT	Maximum Available Control Technology
MMBtu	million British thermal units
NCGs	NCGs
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	nitrogen dioxide

NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
O&M	Operations and Maintenance
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter of 10 micrometers or less
Potlatch	Potlatch Corp.
ppm	parts per million
ppmv	parts per million by volume
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTO	permit to operate
QA/QC	Quality Assurance/Quality Control
RA	relative accuracy
RAA	relative accuracy audit
RATA	relative accuracy test audit
<i>Rules</i>	<i>Rules for the Control of Air Pollution in Idaho</i>
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
tAOP/tCaO	tons of air-dried pulp per ton of lime
T/R	Transformer-Rectification
TRS	total reduced sulfur
T/hr	tons per hour
T/mo	tons per month
T/yr	tons per year
VOC	volatile organic compound

## **PUBLIC COMMENT / AFFECTED STATES/EPA REVIEW SUMMARY**

A 30-day public comment period for Potlatch Corp.'s draft Tier I operating permit was held in accordance with IDAPA 58.01.01.364 (*Rules for the Control of Air Pollution in Idaho*). The comment period ran from September 23 through October 23, 2002. Written comments were submitted by the Potlatch Lewiston facility. Mark Solomon, a private citizen, provided oral comments provided during the September 23<sup>rd</sup> public hearing. The comments and the DEQ's responses are provided in the appendix of this document.

IDAPA 58.01.01.008.01, defines *affected states* as: "*All states: whose air quality may be affected by the emissions of the Tier I source and that are contiguous to Idaho; or that are within fifty (50) miles of the Tier I source.*" A review of the site location information included in the permit application indicates that the facility is located with 50 miles of a state border. Therefore, Washington and Oregon were provided an opportunity to comment on the draft Tier I operating permit.

A proposed permit was developed based on comments submitted during the comment period. The proposed permit was then forwarded to the EPA for their review as required by IDAPA 58.01.01.366. The EPA provided no written objection to the permit.

## **1. PURPOSE**

The purpose of this memorandum is to explain the legal and factual basis for this Tier I operating permit in accordance with IDAPA 58.01.01.362.

On behalf of DEQ, EQ has reviewed the information provided by the Potlatch Corp. (Potlatch) regarding the operation of their Idaho Pulp and Paperboard Division (IPPD) facility located in Lewiston, Idaho. This information was submitted on the requirements of the Tier I permit in accordance with IDAPA 58.01.01.300.

Although this permit covers just the IPPD, for Tier I and other CAA applicability purposes, the facility is considered to include the adjacent CPD. A separate permit for the CPD portion of the facility has been prepared. Potlatch's nearby Clearwater Wood Products Facility has been determined to be a separate source and not part of the CPD/IPPD complex.

Based on the information submitted, DEQ has drafted a Tier I permit for the Potlatch IPPD Lewiston facility. The draft permit was submitted for facility review and then for public comment. A proposed permit was developed based on comments submitted during the comment period. The proposed permit was then forwarded to the EPA for their review as required by IDAPA 58.01.01.366. The EPA provided no written objection to the permit.

## **2. SUMMARY OF EVENTS**

On May 26, 1995, Potlatch submitted a Tier I permit application for the CPD/IPPD complex located in Lewiston, Idaho. The application was determined to be administratively complete on September 18, 1995.

## **3. BASIS OF THE ANALYSIS**

The following documents were relied upon in preparing this memorandum and the Tier I permit:

- Tier I air operating permit application, (May 26, 1995, Potlatch-Lewiston, Idaho).
- Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Office of Air Quality Planning and Standards, EPA.
- Guidance developed by the EPA and DEQ.
- Title V permits issued by DEQ for similar sources.
- Documents and procedures developed in the Title V Pilot Operating Permit Program.

## **4. REGULATORY ANALYSIS – GENERAL FACILITY**

### **4.1 FACILITY DESCRIPTION**

Potlatch Pulp and Paperboard Division operates a kraft pulp mill in Lewiston, Idaho. The mill produces bleached kraft pulp, which is processed in three different areas. Uncoated and coated paperboard is produced in the paper machine area; market pulp is dried on the pulp dryer in the finishing area; and slurried pulp stock is pumped to the Potlatch CPD, which is adjacent to the IPPD. The main process areas are described in more detail below.

## Pulp mill area

The pulp mill area employs the following two fiber lines: the sawdust fiber line utilizing sawdust, and the chip fiber line, which uses wood chips and/or sawdust to produce a brown, fibrous, unbleached pulp. Sawmill plant residuals are the main raw material source for the mill. The brown chip pulp is sent to an oxygen delignification reactor. The chip and sawdust fiber lines further process the pulp by bleaching to remove residual lignin. The pulp mill area includes wood handling, pulping, washing, screening, bleaching, caustic plant, lime kilns, and chemical preparation.

### - Chip Fiber Line

Pulping is the chemical treatment the wood receives in large pressure vessels called digesters. The digesters utilize direct steaming to increase the temperature of the vessel contents. There are 12 batch digesters in the chip fiber line.

The pulping of chips starts by charging the digester with wood chips, weak black liquor from the brown-stock-washing portion of the mill, and white liquor from the caustic plant. The primary active ingredients of the white liquor are sodium hydroxide and sodium sulfide. Relief gases are vented to the turpentine system from the digester periodically during the pulping cycle. Turpentine is condensed and the remaining NCGs are combined with the blow heat vent gases.

When pulping is complete, the steam is shut off and a valve at the bottom of the vessel is opened. Cooked pulp is blown under pressure from the digester into a blow tank. The expanding gases from the blow tank are sent to a blow heat recovery system where the gases are used to heat process water. The remaining NCGs are sent to the caustic plant where they are thermally oxidized, preventing their escape to the atmosphere.

The brown pulp is washed to remove the spent pulping liquors and dissolved solids. Some of this liquor is recycled to the digesters while the major portion is sent to the recovery area. The weak black liquor is washed from the pulp at the pre-oxygen washers and all brown stock-washer- system gases are collected in a HVLC system and thermally oxidized.

Oxygen delignification is used to reduce the lignin content of the pulp from the brown stock washers. The delignified pulp is further washed to remove most of the dissolved solids from the pulp.

The bleach plant removes the remaining lignin to reveal the characteristic white cellulose pulp. This is accomplished through a series of bleaching stages which use a combination of different chemicals, retention time, and pulp washing to extract and remove the lignin. Bleaching chemicals are applied in locations and in amounts so that the estimated emissions listed in this application will not be exceeded.

### - Sawdust Fiber Line

The sawdust fiber line uses two continuous digesters. The pulping of the sawdust starts as the sawdust is fed to the continuous digesters. Sawdust is fed into a rotary lock feeder and dropped into the digester where it is pulped. The cooked pulp is then dropped into a surge tank that continually releases the pulp to the blow tank.

The brown pulp is washed with vacuum washers in the sawdust fiber line. The washed pulp is screened to remove shives and knots. The sawdust fiber line uses a combination of pressurized- and open-screening equipment.

### - Caustic Plant

Green liquor is produced by dissolving the recovery boiler smelt in weak wash or water. The green liquor from the recovery area is pumped to the green liquor clarifier, where the unusable solids

(dregs) from the recovery furnaces settle to the bottom. These solids are transferred to a dregs washer which separates most residual liquor and returns it to the process.

The clarified green liquor is then pumped to the slaker where lime (calcium oxide) is added. The calcium oxide forms calcium hydroxide which reacts with the sodium carbonate contained in the liquor forming calcium carbonate and sodium hydroxide. This produces a mixture of white liquor (containing sodium sulfide and sodium hydroxide) and lime mud (calcium carbonate).

The classifier section of the slaker removes the heavy, unreacted lime particles and grits, which go to the grits washer. The liquor/mud mixture flows to the causticizers where the reaction is completed. The liquor is sent to the white liquor pressure filter where the insoluble calcium carbonate is removed. The filtered white liquor is sent to storage where it is stored until used in the pulping process. The lime mud from the pressure filter is sent to the mud washer pressure filter. Water is added to wash the remaining liquor from the mud; the recovered wash water is referred to as weak wash. The lime mud is pumped to storage and then to the pre-coat filters of the rotary lime kilns.

#### - Lime Kilns

The lime mud is concentrated on the pre-coat filters and makeup lime rock may be added. The mud and/or rock is put into the back end of the lime kiln and fuel is fired into the front end. The calcium carbonate of the mud and rock is converted to calcium oxide and is removed from the front end of the kiln and transported to storage prior to use in the slaker. The No. 2 lime kiln processes only lime rock for use as makeup lime.

### Power and Chemical recovery area

In this area, the weak black liquor from the washers in the pulp mill area is concentrated in the evaporator area, then the resulting heavy black liquor is fired in the recovery boilers. Steam is produced and is used to drive the paperboard machines, produce electricity, and heat various chemical processes. The power and recovery area includes the No. 4 and 5 recovery boilers and evaporation operations; influent water treatment; wastewater treatment; Nos. 1, 2, 3, and 4 power boilers; and gas-fired temporary boilers.

#### - Evaporators

The weak black liquor is sent to a multiple-effect evaporator set. Heating the liquor by reducing the atmospheric pressure in these vessels, the liquor is boiled, producing a concentrated black liquor (heavy black liquor). The condensate recovered from the evaporation of the weak black liquor is discharged to the sewer.

#### - Recovery Boilers

The concentrated black liquor is pumped to the salt-cake mix tanks where it is mixed with the salt cake from the electrostatic precipitators and any required makeup salt cake is added. The liquor is then pumped to the firing guns of the recovery boilers. The liquor is sprayed into the reducing atmosphere of the recovery furnaces. The sodium sulfate content of the liquor is converted to sodium sulfide and the sodium organics are converted to sodium carbonate. The heat released from the combustion of organics is converted to steam energy.

A smelt rich in sodium compounds is formed, tapped from the furnace bed, and dissolved in the smelt-dissolving-tanks. Weak wash from the caustic plant or makeup water is added to the tank to dissolve the smelt, producing green liquor that is fed to the caustic plant.

## 4.2 FACILITY CLASSIFICATION

The combined CPD/IPPD plant is a major facility in accordance with IDAPA 58.01.01.008.10 for all criteria pollutants except lead as well as for HAPs. The combined facility is a designated facility under IDAPA



58.01.01.006.27 and is a PSD major source under IDAPA 58.10.01.006.55. The IPPD facility is subject to New Source Performance Standards in accordance with 40 CFR Part 60, Subparts D, Dc, and BB, and is subject to NESHAP, in accordance with 40 CFR Part 63 Subparts S and MM. The Standard Industrial Classification defining the IPPD facility is 2611. The AIRS/AFS facility classification is A.

#### **4.3 AREA CLASSIFICATION**

The facility is located within AQCR 62 in Nez Perce County. The area is classified as attainment for all federal and state criteria pollutants. There are no Class I areas within 10 km of the facility.

#### **4.4 PERMITTING HISTORY**

The following information was derived from a review of the permit files available to EQ. The following documentation is intended for information use only:

September 20, 1978	DEQ issued a conditional PTC for the No. 4 power boiler.
September 30, 1980	EPA Region 10 issued a PSD permit for the No. 4 power boiler.
May 6, 1983	DEQ issued a PTC for the No. 5 recovery boiler.
August 22, 1984	DEQ issued Operating Permit No. 1140-0001 covering sources at the IPPD, CPD, and Clearwater facilities.
August 19, 1985	DEQ issued an amended Operating Permit No. 1140-0001-315 to include the trash hog.
September 9, 1988	DEQ issued PTC No. 1140-0001 for lime slaking and handling.
September 6, 1994	DEQ issued PTC No. 069-00001 for the oxygen delignification reactor; the permit was amended September 16, 1996.
September 6, 1994	DEQ issued PTC No. 069-00001 for the Chloride Dioxide Plant (Lurgi Chlorine Scrubber). The permit was amended January 31, 1996; September 22, 1999; and February 14, 2000.
May 8, 1995	DEQ issued PTC No. 069-00001 for the No. 4 and No. 5 recovery-boiler salt-cake system; the permit was amended January 29, 1997.
September 3, 1998	DEQ issued PTC No. 069-00001 for two temporary boilers.
November 6, 1998	DEQ issued an amended permit for the temporary boilers.
August 31, 2000	DEQ issued PTC No. 069-00001 for two Thermocompressors supplying steam to the digesters.
February 26, 2002	DEQ issued PTC No. 069-00001 for the No. 3 and 4 lime kiln electrostatic precipitators. This permit was amended June 24, 2002.

#### **4.5 FACILITY-WIDE APPLICABLE REQUIREMENTS**

##### **4.5.1 Rules for the Control of Fugitive Dust - IDAPA 58.01.01.650-651**

Facility-wide Permit Condition 1.1 states that all reasonable precautions shall be taken to prevent PM from becoming airborne in accordance with IDAPA 58.01.01.650-651.

#### 4.5.1.1 Compliance Demonstration

Facility-wide Permit Condition 1.2 states that the permittee is required to monitor and maintain records of the frequency and the methods used by the facility to reasonably control fugitive emissions. IDAPA 58.01.01.651 gives some examples of ways to reasonably control fugitive emissions, which include the use of water or chemicals, applying dust suppressants, using control equipment, covering open-bodied trucks, paving roads or parking areas, and removing materials from streets.

Facility-wide Permit Condition 1.3 requires that the permittee maintain a record of all fugitive dust complaints received. In addition, the permittee is required to take appropriate corrective action as expeditiously as practicable after receipt of a valid complaint. The permittee is also required to maintain records that include the date that each complaint was received, a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

To ensure that the methods being used by the permittee reasonably control fugitive emissions, whether or not a complaint is received, Facility-wide Permit Condition 1.4 requires that the permittee conduct periodic inspections of the facility. The permittee is required to inspect potential sources of fugitive emissions during daylight hours and under normal operating conditions. If the permittee determines that fugitive emissions are not being reasonably controlled, the permittee shall take corrective action as expeditiously as practicable. The permittee is also required to maintain records of the results of each fugitive emissions inspection.

Facility-wide Permit Conditions 1.3 and 1.4 require the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes taking corrective action within 24 hours of receiving a valid complaint or determining that fugitive particulate emissions are not being reasonably controlled meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

#### 4.5.2 **Rules for the Control of Odors - IDAPA 58.01.01.775-776**

Facility-wide Permit Condition 1.5 and IDAPA 58.01.01.776 both state: *"No person shall allow, suffer, cause or permit the emission of odorous gases, liquids or solids to the atmosphere in such quantities as to cause air pollution."*

##### 4.5.2.1 Compliance Demonstration

Facility-wide Permit Condition 1.6 requires the permittee to maintain records of all odor complaints received. If the complaint has merit, the permittee is required to take appropriate corrective action as expeditiously as practicable. The records are required to contain the date each complaint was received, a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

Facility-wide Permit Condition 1.6 requires the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes taking corrective action within 24 hours of receiving a valid odor complaint meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

#### 4.5.3 **Visible Emissions - IDAPA 58.01.01.625**

IDAPA 58.01.01.625 and Facility-wide Permit Condition 1.7 state: *"(No) person shall discharge any air pollutant to the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than 20% opacity as determined by IDAPA 58.01.01.625."* This provision does not apply when the presence of uncombined water, NO<sub>x</sub>, and/or chlorine gas are the only reason(s) for the failure of the emission to comply with the requirements of this rule.